ABSTRACT OF DISCLOSURE

The present invention includes a method for generating an ambiguity-resolved, refraction-corrected, and noise-minimized carrier-phase measurement. The method includes forming a first composite measurement using GPS carrier-phase measurements on the L1, L2 and L5 frequencies. To reduce the noise in the first composite measurement, the method further includes forming a second composite measurement using GPS carrier-phase measurements on at least two of the three GPS carrier frequencies. The second composite measurement is formed to have a small multi-path noise therein so that it can be used to smooth the first composite measurement so that the multipath noise is minimized.